



# ***STRUCTURE PLANS CONTENT & FORMAT***

***Dave Madden, P.E.  
Bridge Design Engineer***



# Agenda

- 1. Opening statement on Content and Format
- 2. Technical requirements in Master Retainer Agreement
- 3. Reasons for consistent Content and Format
- 4. Reference Material and Information – SDDOT Internet Site
  - a. Bridge Design & Plans site
  - b. Downloadable site

Some issues have been noted with structure plans not following SDDOT's Office of Bridge DESIGN (OBD) format and content.

# DOT900-T\_Master Retainer Agreement

## C. PRELIMINARY ENGINEERING TECHNICAL REQUIREMENTS

### 8. PLANS, SPECIFICATIONS, AND ESTIMATES, GENERAL.

Unless otherwise modified by the Work Order, the CONSULTANT will meet the following requirements.

- d. The CONSULTANT will prepare plans in conformance with the DEPARTMENTS customary practices. The CONSULTANT will use standard format for notes, labels, and rates of materials.

# Reasons for consistent format and content:

- **Easier to ensure completeness**
- **Easier for DOT plans reviewers**
- **Easier for Contractors**
- **Easier for Field Engineers & Inspectors**
- **When rehab needed, easier to follow plans**



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[Bridge Design & Plans](#)

## Bridge Design & Plans

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### Technical Memorandums:

- [Survey Vertical Control Datum for Structure Plans](#)
- [Structure Numbers](#)
- [Guidelines for Use of Drainage Structure Options](#)
- [Steel Girder Cross Frames & Torsional Analysis of Exterior Girders for Construction Loading](#)
- [Box Culvert Distribution Reinforcement](#)
- [Bridge Design Quality control/Quality Assurance \(QC/QA\) Practice](#)
- [Pedestrian/Bicycle Railing on Bridges and Structures](#)
- [Steel H-Pile Selection](#)
- [Hydrologic/Hydraulic \(H/H\) Design Quality Control/Quality Assurance \(QC/QA\) Practice](#)
- [Load Rating of New Bridge Superstructure and Box Culvert Designs \(BTM07.1.2\)](#)
- [Distribution of Flexural Reinforcement \(BTM13.4\)](#)
- [Structural Steel Painting \(BTM14.1\)](#)
- [Bridge Construction Quality Assurance/Quality Control \(QA/QC\) Practice \(BTM15.1\)](#)

[Bridge Design Plan Notes](#)

[Structure Plans Reference Sheets](#)

[www.sddot.com/transportation/bridges/design](http://www.sddot.com/transportation/bridges/design)



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## Engineering/Design Services

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The Department of Transportation offers information and publications for use in engineering and design projects by employees as well as outside entities such as contractors and local governments.

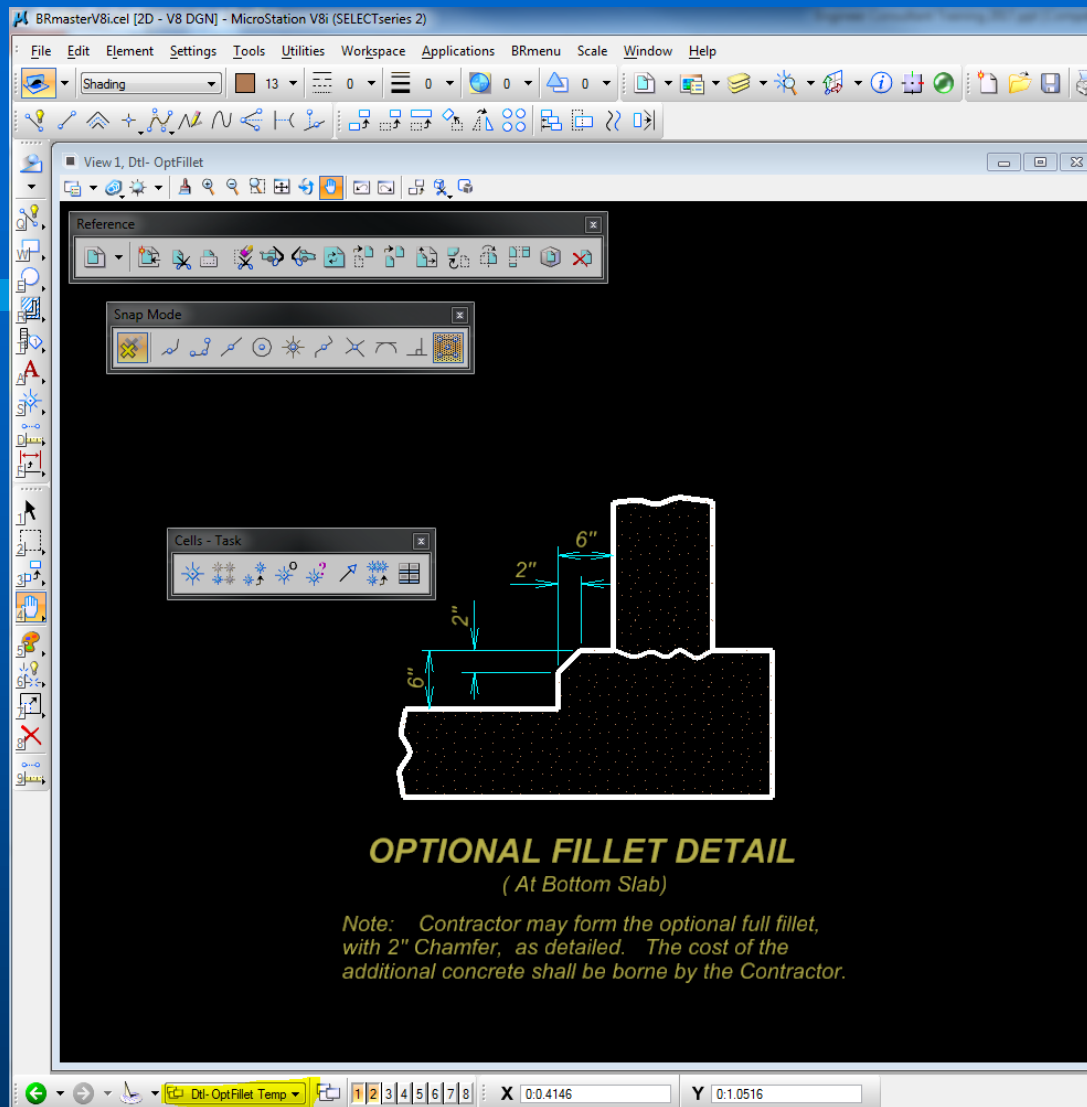
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### Cell Libraries

- Topography Cell Library
- Plan Cell Library
- Plat Cell Library
- Master Cell Library
- Traffic Cell Library
- Markings Cell Library
- Wiring Cell Library
- Cross Section Cell Library
- Erosion Control Cell Library
- Bridge Design Cell Library
- Steel Beam Guardrail Cell Library

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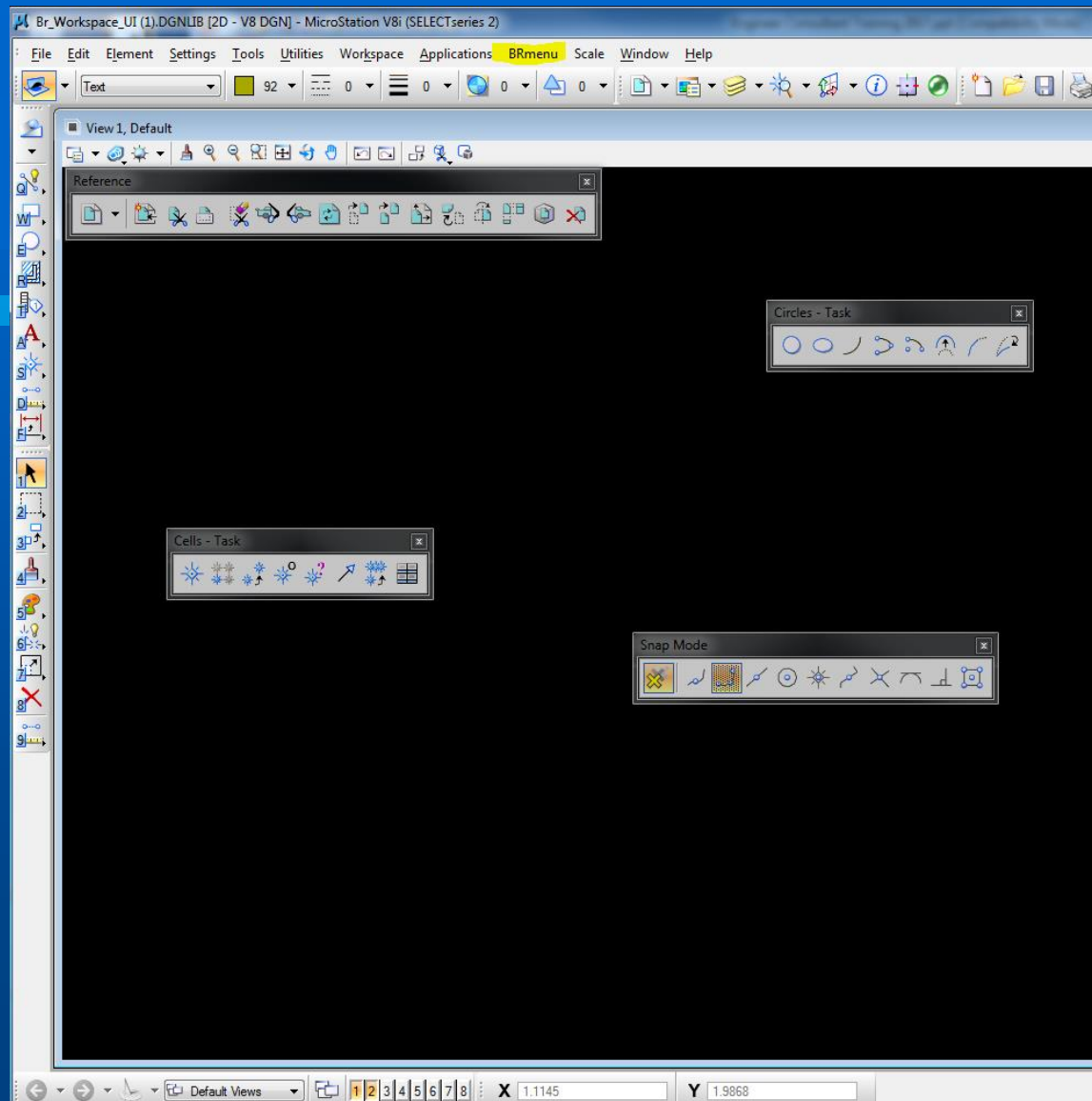


Example of a Bridge Design Cell

## MicroStation DGN Bridge Workspace Library

- br workspace ui.dgnlib

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File for Bridge Workspace Library

## MicroStation Seed Files - Bridge Design

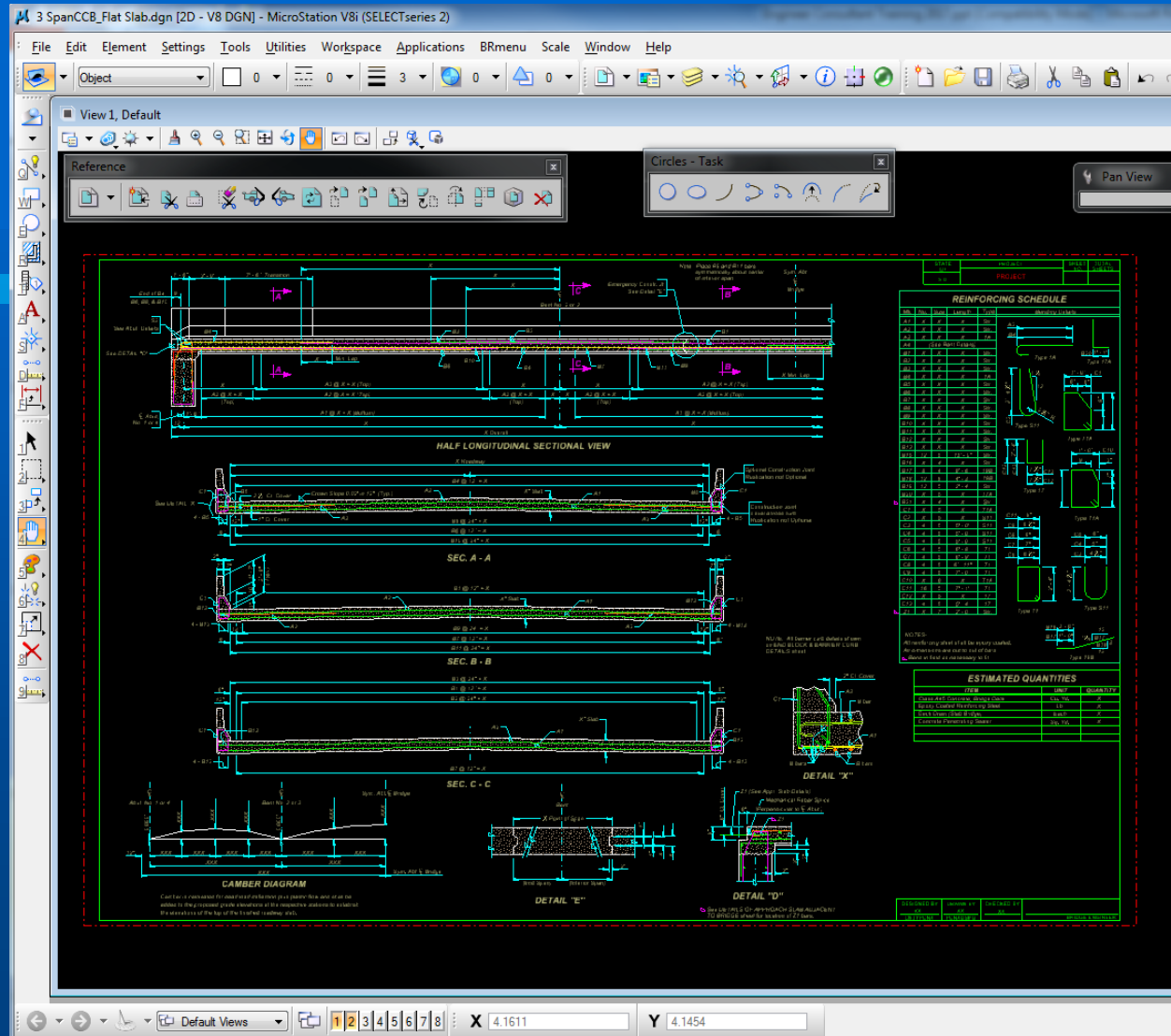
- Box
- Bridge
- Repair
- Standard Plate
- Title Page for Section E





### Microstation Base Sheets - Bridge Design

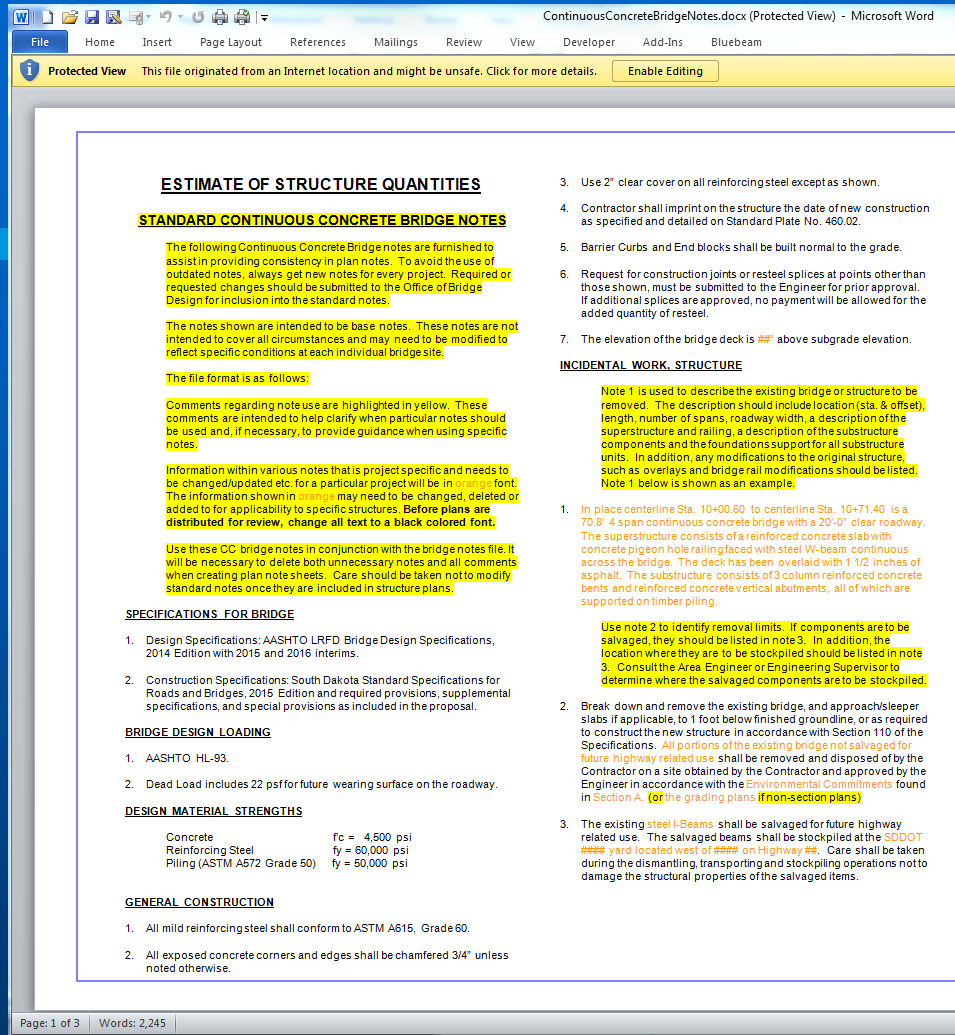
- 3 Span CCB with Haunch
- 3 Span CCB Flat Slab
- 4 Span CCB with Haunch
- 4 Span CCB Flat Slab
- 5 Span CCB with Haunch
- 5 Span CCB Flat Slab
- Approach Slab Expansion Joint for Asphalt Pavement with Curb
- Approach Slab Expansion Joint for Asphalt Pavement without Curb
- Approach Slab Expansion Joint for Concrete Pavement with Curb
- Approach Slab Expansion Joint for Concrete Pavement without Curb
- Prestressed Girder Diaphragm 36 Minnesota Shape
- Prestressed Girder Diaphragm 45 Minnesota Shape
- Prestressed Girder Diaphragm 54 Minnesota Shape
- Prestressed Girder Diaphragm 63 Minnesota Shape
- Prestressed Girder Diaphragm 72 Minnesota Shape



Base sheet for 3 Span CCB Flat Slab

- Section E - Structure Notes
  - Ancillary Bridge Notes
  - Reinforced Concrete Slab Bridge Notes
  - Pre-stressed Concrete I-Girder Bridge Notes
  - Steel I-Girder Bridge Notes
  - Reinforced Concrete Box Culvert Extension Notes
  - Reinforced Concrete Box Culvert (CIP) Notes
  - Reinforced Concrete Box Culvert (Pre-cast) Notes
  - Gravity Large Concrete Block Retaining Wall Notes
  - Gravity Segmental Block Retaining Wall Notes
  - MSE Large Panel Retaining Wall Notes
  - MSE Segmental Block Retaining Wall Notes
  - MSE Wire Face Retaining Wall Notes
  - Reinforced Concrete Retaining Wall Notes
  - Stone Faced Reinforced Concrete Retaining Wall Notes

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# Example of Structure Notes

## Structure Plans Reference Sheets

- Section E Title Sheet
- Section E Quantities Sheet
- Concrete Box Culvert
- Continuous Concrete Bridge
- Prestressed Concrete Girder Bridge
- Steel Girder Bridge





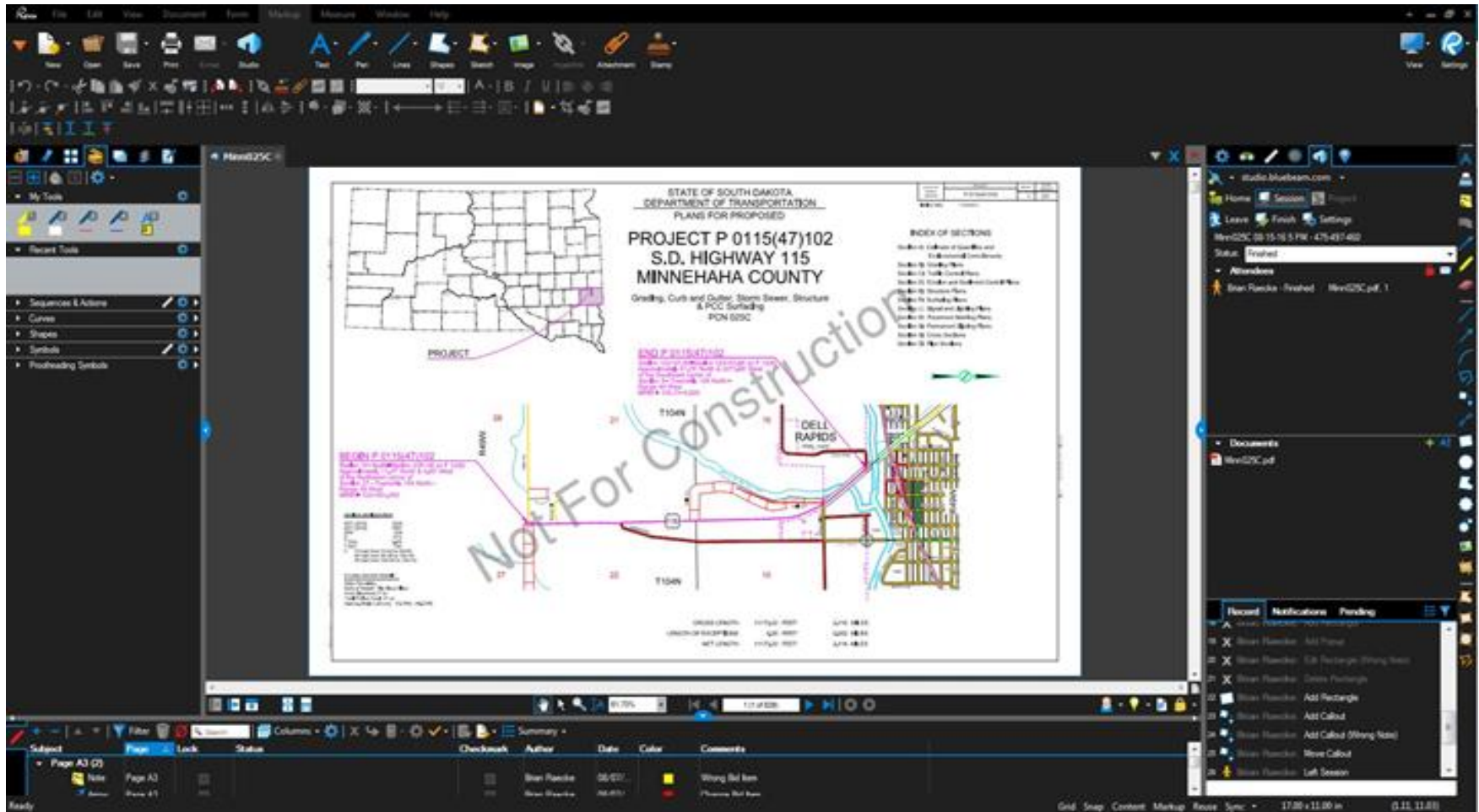






Questions?

# Plans Quality, Format, Review & Content



## Brian Raecke – Chief Road Design Engineer





# Consistency

**When looking at the plans, you should not be able to tell who created them: Central Office, Region Office, or Consultant (other than the company/PE stamp)**

# **Contractual Requirements**

## **Master Retainer Agreement**

### **DOT 900-T C. 4. a. –**

**a. Roadway design will be in accordance with the edition of the Department of Transportation Road Design Manual (and its revisions) currently in place at the time of execution of the Work Order and the American Association of State Highway and Transportation Officials (AASHTO) Specifications, “A Policy on Geometric Design of Highways and Streets” (2011 or the version in place at the time of execution of the Work Order), and interims, or the local roads plan.**

# **Contractual Requirements**

## **Master Retainer Agreement**

### **DOT 900-T C. 8. d. –**

**d. The CONSULTANT will prepare plans in conformance with the DEPARTMENT'S customary practices. The CONSULTANT will use standard format for notes, tables, and rates of materials.**

# Contractual Requirements

## Master Retainer Agreement

### DOT 900-T C. 8. e. –

e. The CONSULTANT will prepare plans on sheets 11" x 17" or 8 ½" x 11" in size, under the guidance of the Road Design Manual's Chapter 18 – Plans Assembly:

[www.sddot.com/business/design/forms/roaddesign/Default.aspx](http://www.sddot.com/business/design/forms/roaddesign/Default.aspx) or as directed by the DEPARTMENT. The CONSULTANT will follow the specific section of the Road Design Manual's Chapter 18 as it relates to plans produced by consultants in order to provide accurate electronic plans and bid items for the DEPARTMENT'S electronic bidding system. The CONSULTANT will utilize the DEPARTMENT'S web site: <http://www.sddot.com/business/design/Default.aspx> for Plan Preparation ----- The CONSULTANT will follow the properties and procedures set up for the DEPARTMENT'S electronic plans as set forth in documents located at the following web site address:  
[South Dakota Department of Transportation - CADD Manual](#)



# Download files

- Download and use the base files provided on the website.

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- Do **NOT** copy old plans. Plan notes/details change over time and will cause issues if the current version is not used.



# Wording for payment

Use the same terminology as the Spec book

- ...the contract unit price per *unit* for *bid item description*.

(Ex: ...paid for at the contract unit price per cubic yard for Unclassified Excavation.)

- ...the contract lump sum price for *bid item description*.

(Ex: ...incidental to the contact lump sum price for Incidental Work.)

# Specification References

- Do not refer to ‘Standard Specifications’, but simply ‘Specifications’ (many are modified by supplementals)
- Include periods, only when they appear in the specifications (leave a space if there is no period)
- Do not include the last period (unless it is the end of a sentence)

# Specification Reference Example

(referring to the salvaging & stockpiling of granular)

## 270.3 CONSTRUCTION REQUIREMENTS

- A. **General:** The Contractor shall not dispose of salvaged material or use the salvaged material for any purpose other than purposes designated in the plans without approval by the Engineer.
- B. **Salvage and Stockpile Granular Material or Salvage and Stockpile Asphalt mix and Granular Base Material:**
  - 1. **Salvaging:** The salvaged material shall be removed and loaded in a manner that minimizes waste and avoids contamination of the salvage material with underlying subgrade soil. Scrapers shall not be used for the removing or loading operations, but may be used to haul the material. Salvaging of material shall not exceed 2 miles in advance of the grading operation. Salvaging of material may extend to 3 miles in advance of the grading operation if approved by the Engineer. The Engineer will only

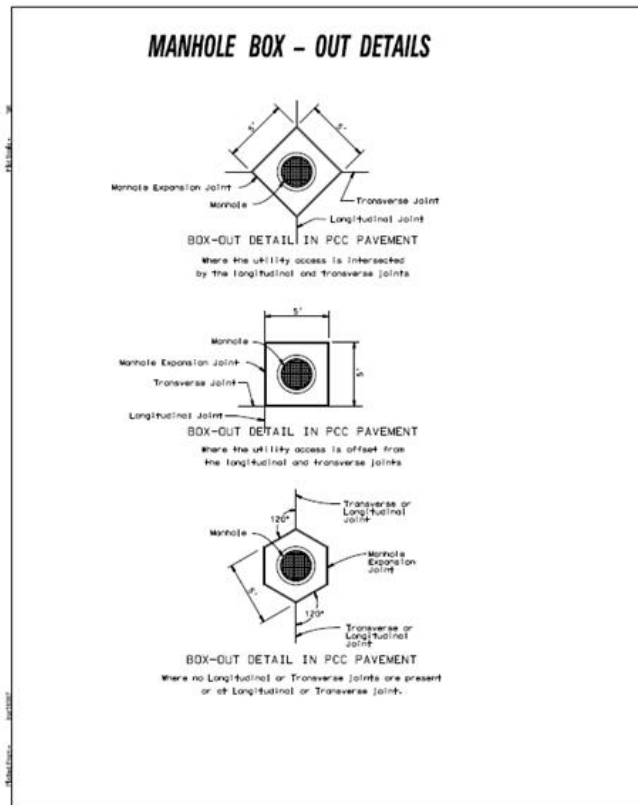
**Correct: ...as per Section 270.3 B.1 of the Specifications.**

**Incorrect: ...as per Section 270.3.B.1. of the Standard Specifications.**

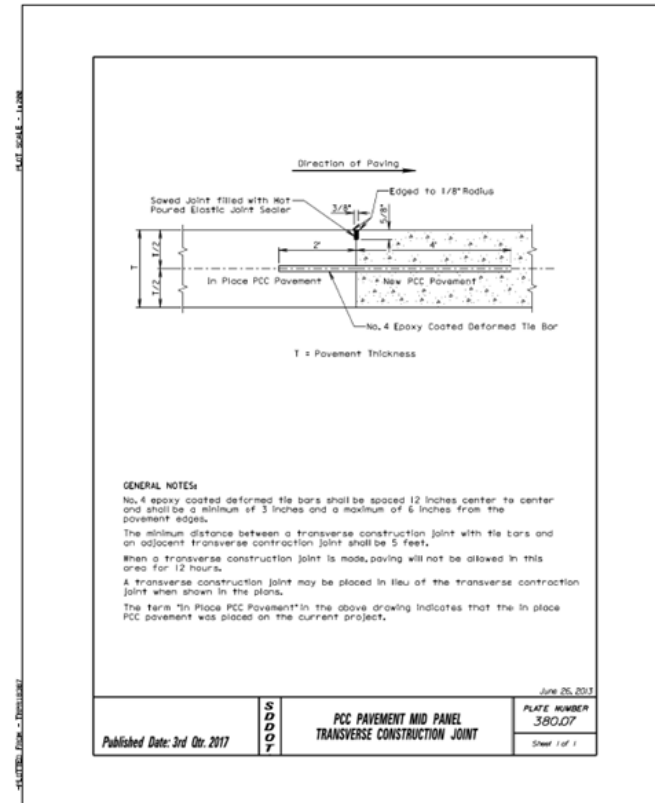


# Plates vs. Details

If it is not a standard plate, as available on the SDDOT website, then it is a detail and is not to resemble a standard plate in look or border.



←  
**Detail  
Vs.  
Plate**  
→



# Don't “absorb” work

Use bid items to pay for the work required.

- If small quantities, or the work is unique, use a lump sum item or a generic bid item.

**Example:**      **Incidental Work, Lump Sum**  
                     **Miscellaneous Work, Site**

# Final Review

- For final review:
  - The document must be a searchable pdf
- After final review:
  - You must respond to all comments.
  - Do not set the status as “Completed” to a review comment and then ignore the comment.
  - If the comment is rejected, you must email the reviewer as to why the comment was rejected.

# **Contractual Requirements**

## **Master Retainer Agreement**

### **DOT 900-T C. 4. b. –**

**b. The CONSULTANT will complete and furnish to the DEPARTMENT, at the time the plans are delivered to the DEPARTMENT, a DEPARTMENT provided checklist. This checklist will provide certification that a separate check has been performed, all review revisions have been made, and the plans are correct and complete.**



# **Rejecting Review Comments**

## **(Electronic Plan Review Manual)**

**Any Consultant/Designer that rejects a comment shall Alert the person that made the review comment and the Project Manager with their rejection response. The Project Manager shall confirm that all comments have been given a status and if the comment has been rejected an Alert has been sent to the reviewer. All Alerts are recorded and will become a part of the Session Report.**



# Replying to the Rejected Comments

**In the Bluebeam Markup List after you set the Status of a comment to “Rejected” the Consultant/Designer shall reply to the rejected comments by right clicking on the comments and giving the response for the rejection.**

# Alerting the Reviewers to Rejected Comments

The Consultant/Designer shall Alert the Reviewer and the SDDOT Project Manager by selecting both the comment with the rejected status and the rejection response in the Bluebeam Markup List and then right clicking on the selected items.

Then click on Alert Attendee and select the reviewers name and the SDDOT Project Manager's name. When you click on OK an email will be sent to notify those individuals of the rejected comment.

# Markup Alert Email

The email that is sent to the reviewer and SDDOT Project Manager includes a picture of the review comment, the rejection response and who rejected the comment. Hyperlinks in the email will take the reviewer to the exact location of the comment and response in the plan review.

## Markup Alert in Minn025C (614-976-167)

Raecke has alerted you to this [Re: Cloud+](#):



**Subject:** Cloud+

**Document:** Minn025C.pdf

**Space:**

**Comment:** Should be a Type II Lab

**Author:** John Smith

**Page:** Page 9 - B3

**Layer:**

**Status:** Rejected

# Reviewers Opportunity to Contest the Rejected Comment

If Reviewer wants to contest the rejected comment they can send the Consultant/Designer, that rejected the comment, an email by right mouse button clicking on the Consultant/Designer name in the attendee list (upper right corner of the Bluebeam screen) then select E-mail. The SDDOT Project Manager shall be included in the email.

# Questions?

